## CLAIMS

**Please amend the claims as follows:**

1. (currently amended) A data transmission system, comprising:

~~a hub including a plurality of adapters~~;

a crossbar switch ~~coupling said plurality of adapters~~;

~~said~~ a plurality of network adapters coupled for communication therebetween by said crossbar switch ~~including at least a requesting adapter and at least a destination adapter~~, wherein each of said plurality of network adapters includes[[:]] a serial communication controller including ~~, further includes~~:

means for converting ~~a first~~ data frames into a bit stream of serial data before transmitting said serial data to said crossbar switch; and

means for converting a bit stream of ~~said~~ serial data received from said crossbar switch into ~~said first~~ data frames of parallel bytes before transmitting said ~~first~~ data frames toward an attached network~~; and~~

~~a plurality of data processing systems, including at least a requesting data processing system and at least a destination data processing system, coupled to said hub via said requesting adapter and said destination adapter~~.

2. (currently amended) The data transmission system according to Claim 1, wherein each of said plurality of network adapters ~~further~~ includes:

[[a]] control logic for generating a request signal (REQ) to said crossbar switch when said ~~requesting~~ adapter requests transfer of ~~at least said first~~ data frames to ~~said destination~~ another network adapter.

3. (currently amended) The data transmission system according to Claim 2, wherein each of said plurality of network adapters ~~further~~ includes:

a clock multiplier for multiplying a data clock ~~of the system by sixteen~~ and for providing said control logic with timing pulses utilized to transmit said request signal (REQ)~~, wherein said request signal (REQ) is an encoded signal of thirty-two bits~~.

4. (currently amended) The data transmission system according to Claim 2 [[3]], wherein said request signal (REQ) includes [[a]] first ~~pair of~~ data bytes ~~including sixteen bits~~ defining a destination address of ~~said~~ data ~~frame~~ to be transmitted and [[a]] second ~~pair of~~ data bytes ~~including sixteen bits~~ representing a connection time defined by a number of slots of said crossbar switch in which the data are to be transmitted.

5. (currently amended) The data transmission system according to Claim 4, wherein said first data bytes ~~defining said destination address includes a first bit for each of said plurality of adapters and a second bit set when said destination address corresponds to said destination adapter of said plurality of adapters, said second bit designating~~ designate a point-to-point connection, a multicast connection, or a broadcast connection.

6. (currently amended) The data transmission system according to Claim 1 [[2]], wherein said means for converting data frames into a bit stream of serial data comprises ~~serial communication controller further includes~~:

means for generating serial data in a high-level data link control (HDLC) format ~~a second data frame, in response to receiving said first data frame, said requesting data processing system coupled to said requesting adapter~~ before transmitting said ~~second data frame~~ serial data to said crossbar switch.

7. (currently amended) The data transmission system according to Claim 6, wherein said means for generating serial data comprises ~~generating means in said serial communication controller further includes~~:

means for generating a first ~~second data frame~~ flag to start ~~said second~~ a data frame;

means for serializing a plurality of incoming parallel data bytes;

means for computing a frame check sequence (FCS) after serializing said plurality of incoming parallel data bytes; and

means for generating a ~~another said~~ second ~~data frame~~ flag to end the ~~said second~~ data frame.

8. (currently amended) The data transmission system according to Claim 6 [[2]], wherein said means for converting a bit stream of serial data received from said crossbar switch into data frames comprises ~~serial communication controller further includes~~:

means for converting serial data received from the crossbar switch in the a high-level data link control (HDLC) format ~~said second data frame received from said crossbar switch~~ into local area network (LAN) data frames ~~said first data frame to be transmitted to said destination adapter~~.

9. (currently amended) The data transmission system according to Claim 8, wherein said means for converting serial data received from said crossbar switch into data frames comprises ~~means further includes~~:

~~means for detecting a starting second data frame in an incoming second data frame~~;

means for checking data integrity ~~of said second data frame~~ by computing a frame check sequence (FCS)~~; and~~

~~means for deserializing a plurality of data bits of said second data frame to provide a plurality of data bytes in said first data frame~~.

10. (currently amended) The data transmission system according to Claim 9, wherein each of said plurality of network adapters further includes:

a memory ~~divided into~~ including ~~at least two independent areas,~~ a ~~first data processing system~~ network-to-switch area organized in a first plurality of buffers for storing data ~~at least said first data frame received from a data processing system coupled to said adapter~~ to be transmitted via said crossbar switch ~~to another data processing system~~, and a ~~second~~ switch-to-network ~~data processing system~~ area organized in a second plurality of buffers for storing ~~said first~~ data ~~frame~~ received from said crossbar switch ~~another data processing system~~.

11. (currently amended) The data transmission system according to Claim 1, wherein each of said plurality of network adapters further includes:

an internal parallel bus coupled to the serial communication controller; and

a network controller , coupled to the internal parallel bus, for converting ~~said first~~ data ~~frame~~ received in serial format from ~~said requesting data processing system coupled to said~~

~~coupled adapter~~ an attached network into parallel data bytes and for transmitting the parallel data bytes to the serial communication controller via the internal parallel bus.

12. (currently amended) The data transmission system according to Claim 11, wherein said network controller further includes:

a clock circuit ~~to synchronize operation of said controller~~;

means for synchronizing said clock circuit during a set of preamble bytes when receiving an incoming ~~said first~~ data frame from an attached network;

means for detecting the incoming ~~said first~~ data frame ~~incoming~~ through a delimiter byte ~~of said first data frame~~;

means for checking data integrity of said ~~first~~ incoming data frame by computing a set of frame check sequence (FCS) bytes;

means for removing ~~a set of~~ protocol information of said incoming ~~first~~ data frame; and

means for deserializing ~~a set of~~ remaining incoming bits of said incoming data frame to provide a set of parallel data bytes.

13. (currently amended) The data transmission system according to Claim 11, wherein said network controller further includes:

means for serializing a set of incoming data bytes received from said serial communication controller;

means for generating ~~the~~ protocol information bytes to be included in an outgoing ~~said first~~ data frame; and

means for computing a frame check sequence (FCS) of said ~~first~~ outgoing data frame before transmitting said ~~first~~ outgoing data frame on an attached network ~~to said destination data processing system coupled to said destination adapter~~.

14. (currently amended) The data transmission system according to Claim 11, further comprising:

an arbiter for ~~taking care of the~~ resolving contention between requests to send from said network controller and requests to send from said serial communication controller.

15. (currently amended) The data transmission system according to Claim 1, wherein said crossbar switch further includes:

a scheduler for scheduling data transmission between attached networks based upon requests to transmit received from said plurality of adapters ~~determining whether or not a request to transmit said first data frame from a data processing system to another data processing system should be granted~~.

16. (currently amended) The data transmission system according to Claim 15, wherein said scheduler further includes:

an algorithm unit for determining the best data connection to establish ~~at each time~~ based upon ~~the~~ selection of ~~the~~ a request amongst all requests concurrently received from said plurality of adapters which meets a predetermined criterion ~~criteria~~.

17. (currently amended) A data transmission system, comprising:

~~a hub including a plurality of local area network (LAN) adapters;~~

an asynchronous transfer mode (ATM) crossbar switch ~~coupling said plurality of LAN adapters~~;

~~said~~ a plurality of local area network (LAN) ~~LAN~~ adapters coupled for communication therebetween by said ATM crossbar switch, ~~including at least a requesting LAN adapter and at least a destination LAN adapter,~~ wherein each of said LAN adapters includes ~~including~~[[:]] a serial communication controller including ~~, further includes~~:

means for converting parallel data bytes of a LAN data frame into a bit stream of serial data implemented as concatenated slots of an ATM cell size in high-level data link control (HDLC) format before transmitting said serial data to said ATM crossbar switch; and

means for converting ~~said~~ a bit stream of serial data implemented as concatenated ATM cells received from said ATM crossbar switch into ~~said~~ parallel bytes of a LAN data frame before transmitting said LAN data frame toward an attached LAN~~; and~~

~~a plurality of local area networks (LANs), including at least a requesting LAN and at least a destination LAN, coupled to said hub via said requesting LAN adapter and said destination LAN adapter~~.

18. (currently amended) The data transmission system according to Claim 17, wherein each of said LAN adapters ~~further~~ includes:

[[a]] control logic for generating a request signal (REQ) to said ATM crossbar switch when said ~~requesting~~ LAN adapter requests transfer of at least a LAN data frame to another ~~said destination~~ LAN adapter.

19. (currently amended) The data transmission system according to Claim 18, wherein each of said plurality of LAN adapters ~~further~~ includes:

a clock multiplier for multiplying a data clock ~~of the system by sixteen~~ and for providing said control logic with timing pulses utilized to transmit said request signal (REQ)~~, wherein said request signal (REQ) is an encoded signal of thirty-two bits~~.

20. (currently amended) The data transmission system according to Claim 18 [[19]], wherein said request signal (REQ) includes [[a]] first ~~pair of~~ data bytes ~~including sixteen bits~~ defining a destination address of ~~said LAN~~ data ~~frame~~ to be transmitted and [[a]] second ~~pair of~~ data bytes ~~including sixteen bits~~ representing a connection time defined by a number of slots of said ATM crossbar switch in which the data are to be transmitted.

21. (currently amended) The data transmission system according to Claim 20, wherein said first data bytes ~~defining said destination address includes a first bit for each of said plurality of LAN adapters and a second bit set when said destination address corresponds to an associated LAN adapter of said plurality of LAN adapters, said second bit designating~~ designate a point-to-point connection, a multicast connection, or a broadcast connection.

22. (currently amended) The data transmission system according to Claim 17 [[18]], wherein said means for converting parallel bytes of a LAN data frame comprises ~~serial communication controller further includes~~:

means for generating a high-level data link control (HDLC) frame~~, in response to receiving said LAN data frame said requesting LAN coupled to said requesting LAN adapter~~ before transmitting said HDLC frame to said ATM crossbar switch.

23. (currently amended) The data transmission system according to Claim 22, wherein said means for generating serial data comprises ~~generating means in said serial communication controller further includes~~:

means for generating a high-level data link control (HDLC) flag to start said HDLC frame;

means for serializing a plurality of incoming parallel data bytes;

means for computing a frame check sequence (FCS) after said plurality of incoming parallel data bytes; and

means for generating another ~~said~~ HDLC flag to end said HDLC frame.

24. (currently amended) The data transmission system according to Claim 22 [[18]], wherein said serial communication controller further includes:

means for converting a high-level data link control (HDLC) frame received from said ATM crossbar switch into a ~~said~~ LAN data frame ~~to be transmitted to said destination LAN adapter~~.

25. (currently amended) The data transmission system according to Claim 24, wherein said means for converting a high-level data link control (HDLC) frame received from said ATM crossbar switch into a LAN data frame comprises ~~converting means further includes~~:

means for detecting a starting high-level data link control (HDLC) frame in an incoming HDLC frame;

means for checking the data integrity of said HDLC frame by computing a frame check sequence (FCS); and

means for deserializing a plurality of data bits of said HDLC frame to provide a plurality of data bytes in said LAN data frame.

26. (currently amended) The data transmission system according to Claim 25, wherein each of said plurality of LAN adapters further includes:

a memory including ~~divided into at least two independent areas,~~ a first LAN-to-switch area organized in a first plurality of buffers for storing ~~said~~ LAN data frames ~~received from a~~

~~LAN coupled to said LAN adapter~~ to be transmitted to another LAN via the ATM crossbar switch, and a second switch-to-LAN area organized in a second plurality of buffers for storing ~~said~~ LAN data frames received from another LAN via the ATM crossbar switch.

27. (currently amended) The data transmission system according to Claim[[s]] 17, wherein each of said plurality of LAN adapters ~~further~~ includes:

an internal parallel bus coupled to the serial communication controller; and

a LAN controller, coupled to the internal parallel bus, for converting ~~said~~ LAN data frames received in serial form from an attached ~~said requesting~~ LAN ~~coupled to said coupled LAN adapter~~ into parallel data bytes and for transmitting the parallel data bytes to the serial communication controller via the internal parallel bus.

28. (currently amended) The data transmission system according to Claim 27, wherein said LAN controller further includes:

a clock circuit ~~for synchronize operation of said LAN controller~~;

means for synchronizing said clock circuit during a set of preamble bytes when receiving ~~said~~ an incoming LAN data frame from an attached LAN;

means for detecting said incoming LAN data frame ~~from incoming~~ through a delimiter byte ~~of said frame~~;

means for checking data integrity of said incoming LAN data frame by computing a set of frame check sequence (FCS) bytes;

means for removing ~~a set of~~ protocol information of said incoming LAN data frame; and

means for deserializing ~~a set of~~ remaining incoming bits of said incoming LAN data frames to provide a set of parallel data bytes.

29. (currently amended) The data transmission system according to Claim 27, wherein said LAN controller further includes:

means for serializing a set of incoming data bytes received from said serial communication controller;

means for generating ~~the~~ protocol information bytes to be included in ~~said~~ an outgoing LAN data frame; and

means for computing a frame check sequence (FCS) of said outgoing LAN data frame before transmitting said outgoing LAN data frame to ~~said destination~~ an attached LAN ~~coupled to said destination LAN adapter~~.

30. (currently amended) The data transmission system according to Claim 27, further comprising:

an arbiter resolving ~~for taking care of the~~ contention between requests to send from said LAN controller and requests to send from said serial communication controller.

31. (currently amended) The data transmission system according to Claim 17, wherein said ATM crossbar switch further includes:

a scheduler for scheduling data transmission between attached networks based upon requests to transmit received from said plurality of adapters ~~determining whether or not a request to transmit a LAN data frame from a LAN to another LAN should be granted~~.

32. (currently amended) The data transmission system according to Claim [[32]] 31, wherein said scheduler further includes:

an algorithm unit for determining the best data connection to establish ~~at each time~~ based upon ~~the~~ selection of ~~the~~ a request amongst all requests concurrently received from the plurality of LAN adapters which meets a predetermined criterion ~~criteria~~.

33. (new) The data transmission system of Claim 4, wherein:

said control logic comprises first control logic that generates said request signal (REQ) during a last time slot of a previous transmission via said crossbar switch;

said crossbar switch includes second control logic for generating a grant signal (GNT) to a network adapter during said last time slot of said previous transmission; and

said first control logic, responsive to receiving said grant signal (GNT), transmits data for said number of slots specified by said request signal (REQ) immediately after said last time slot of said previous transmission.

34. (new) The data transmission system of Claim 20, wherein:

said control logic comprises first control logic that generates said request signal (REQ) during a last time slot of a previous transmission via said ATM crossbar switch;

said crossbar switch includes second control logic for generating a grant signal (GNT) to a LAN adapter during said last time slot of said previous transmission; and

said first control logic, responsive to receiving said grant signal (GNT), transmits data for said number of slots specified by said request signal (REQ) immediately after said last time slot of said previous transmission.